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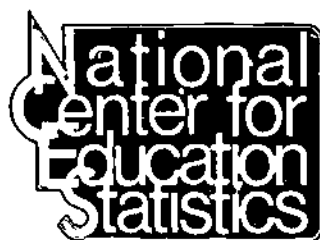
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ABSTRACT

Data from high school transcripts of about 12,000 students who graduated in 1982 were examined, relevant to a number of popular beliefs about vocational education. Compared to students in private high schools, students in public high schools were more likely to be enrolled in vocational courses. The average number of total credits earned in vocational education was greatest among graduates of schools that are located in the North Central region of the country; located in rural, as opposed to urban or suburban areas; and small (less than 600 students). The extent of student participation in vocational education was found to be related to race/ethnicity, cognitive test performance, socioeconomic status (SES), and high school program. Students who earned the most credits in vocational education were Hispanic, scored in the lowest quartile on the cognitive test battery, had a comparatively low SES, and were in a vocational program. Sex differences in overall vocational coursetaking were apparent. (Technical notes describe classification of courses, alternative classifications, course credits and coding, sample size, and standard errors. Five data tables are appended.) (YLB)

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bulletin

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PATTERNS OF PARTICIPATION IN SECONDARY VOCATIONAL EDUCATION - 1978-1982

About one-fifth of all credits earned in grades 9 through 12 by the average high school graduate in 1982 were in the broad area of vocational education. While only 27 percent of the graduates considered themselves to have been in a vocational education program, fully 95 percent had taken at least one vocational education course during their 4 years in high school.¹

These are some of the findings of High School and Beyond (HS&B), the Center's longitudinal study of high school sophomores and seniors. Base-year data were collected in spring 1980. In 1982, complete high school transcripts were obtained for about 12,000 students who graduated that year.²

This bulletin examines the evidence, from the transcript data, relevant to a number of popular beliefs about vocational education: (1) that it is taught predominantly in public schools; (2) that it is predominantly offered by rural or small schools; (3) that it is taken primarily by students of low socioeconomic status (SES) and by ethnic minority students; (4) that academic (college preparatory) students take very few courses in vocational education; and (5) that there are sex differences in overall vocational coursetaking behavior.

¹Of the 4.2 credits earned in vocational education over 4 years by the average graduate, 0.6 (14 percent), 0.8 (19 percent), 1.3 (31 percent) and 1.5 (36 percent) credits (percentage of total) were earned during the 9th, 10th, 11th and 12th grades respectively. It should also be pointed out that 55 percent of the sample took at least one vocational course during the 9th grade, 63 percent during the 10th grade, 73 percent during the 11th grade, and 77 percent during the 12th grade.

²A description of the sample is provided in the technical notes at the end of this bulletin.

Public vs. Private Schools

Compared to students in private high schools, students in public high schools are more likely to be enrolled in vocational courses. The average private school student earned 2.0 credits in vocational education courses while the average public school student earned 4.4 credits (table 1). The difference is more noteworthy in light of the fact that the total number of credits earned (both vocational and nonvocational) by an average private school student was greater than the total credits earned by an average public school student (23.1 vs. 21.6, respectively).³

When vocational courses are categorized as either occupational or exploratory, the public/private differences are still pronounced. The mean number of credits earned in occupational vocational education courses was much higher for the public school students than for the private (2.1 vs. 0.9, respectively). The corresponding values for exploratory type courses were 2.3 and 1.1, respectively.

If attention is directed at the percentage of students who participated at any level in vocational education, it is apparent that 96 percent of the public school students did so, as compared with 84 percent of the private school students. When attention is restricted to occupational vocational education courses the difference is retained (77 percent public vs. 56 percent private).

The remainder of this bulletin deals only with vocational education in public schools.

Vocational Education Participation as Related to School Characteristics

It can be seen in tables 2 and 3 that the average number of total credits earned in vocational education was greatest among graduates of schools which are:

- o located in the North Central region of the country.
- o located in rural, as opposed to urban or suburban areas.
- o small (less than 600 students).

With regard to regional differences, students who graduated from schools in the North Central region earned more vocational education credits, on the average, than did graduates in the Northeast, South, or West (4.8, 4.0, 4.5, and 4.2, respectively). Overall, the North Central graduates were also more likely to have participated in courses classified as occupational (82 percent as compared with 72, 75, and 77 percent, respectively) (table 2).

³Group differences cited in the text are statistically significant at the .05 level on the basis of two-tailed t tests.

Similarly, the average public high school graduate who attended a rural rather than an urban or suburban school earned more credits in vocational education (4.9 units as compared with 4.1 and 4.2 units, respectively). The average rural graduate differed from the average suburban or urban graduate in the amount of coursework taken in both occupational and exploratory vocational courses.

In general, students attending smaller public schools tended to earn more credits in vocational education than those attending larger schools. In schools with enrollments under 600, the average student earned 5.0 credits in vocational courses as compared with 4.4 credits by students in medium-sized schools (601 to 1,800 enrollment), and 4.0 credits by students in large schools (enrollment over 1,800). As can be seen in table 3, these differences are due largely to differences in exploratory rather than occupational type courses.

vocational Education Participation as Related to Student Characteristics

The extent of student participation in vocational education was found to be related to race/ethnicity, cognitive test performance, socioeconomic status (SES), and, as would be expected, high school program (academic, general, or vocational). Each of these relationships is examined below.

The average Hispanic graduate earned more credits in vocational education than did the average black or white graduate (5.0 as compared with 4.5 and 4.3, respectively). These differences are due largely to the higher enrollments in exploratory vocational courses by Hispanic students (table 4).

Students scoring in the lowest quartile on the cognitive test battery earned more credits in both exploratory and occupational vocational courses (averages of 2.8 and 2.6) than did students in the middle two quartiles (averages of 2.5 and 2.4, respectively) or those in the top quartile (1.6 and 1.3, respectively). These differences are due largely to the fact that the low quartile students were more heavily involved in consumer home economics and trade-and-industrial courses (table 4). Similarly, the higher the SES level the lower the percentage of students participating in occupational training (67, 79, and 82 percent, for high, middle, and low SES students).

As might be expected, students who classified themselves as being in a vocational program, as distinguished from an academic or a general program, earned more credits in vocational education (6.5 as compared with 2.7, and 4.6, respectively) (table 5). The average vocational student earned almost twice as many credits (3.7) in occupational vocational education as did the average general program student (1.9) and over three times as many as the average academic program student (1.1). As can be seen in table 5, exploratory vocational credits made up a higher proportion of all vocational credits earned

by the average academic program student and general program student than was the case for the average vocational program student (59, 59, and 43 percent, respectively). In other words, the vocational program students tended to concentrate on occupational preparation courses rather than exploratory courses.

Within each of these three program areas, sex differences in overall vocational coursetaking are apparent (table 5). For example, among academic program students the average male earned more total vocational credits than the average female in industrial arts (0.9 vs. 0.1) and trade and industrial (0.5 vs. 0.2). By contrast, the average female earned more credits than the average male in consumer home economics (0.6 vs. 0.2), and business (1.4 vs. 0.8). Among vocational program students, the average female earned more credits than the average male in occupational type courses (4.0 vs. 3.3) but fewer credits in exploratory type courses (2.6 vs. 3.0).

TECHNICAL NOTES

Classification of Courses

All courses in each transcript were assigned a 6-digit code based on A Classification of Secondary School Courses (CSSC) which was developed by Evaluation Technologies, Inc. under contract with NCES, July 1982. A panel of vocational education experts⁴ subsequently attempted to identify all vocational courses listed in the CSSC and classify each into one of nine subject matter areas: agriculture, business, marketing, technical occupations, health, trade and industrial, vocational home economics, industrial arts, or consumer home economics. The panel further classified each vocational course as exploratory or occupational. An exploratory course provides an overview or general introduction to a vocational area, while an occupational course provides specific job-related training. For tabulation purposes consumer and homemaking education courses were included in the exploratory group. Since the panel only had course titles to use in making these classifications, they must be considered tentative.

Alternative Classifications

Differences of opinions exist among vocational education curriculum experts as to whether a given vocational course should be classified as exploratory or occupational. Although the tabulations included in this report classify many introductory courses as exploratory, it is conceivable that some experts would feel justified in classifying these same courses as occupational. Consequently,

⁴This panel was coordinated by the Deputy Director, Division of Vocational Education Services, U.S. Department of Education.

additional tabulations based on alternative ways of categorizing introductory vocational courses were produced, and these reflect the views of other vocational education experts. These tables are available to interested parties.

Course Credits and Coding

For this analysis, the number of credits earned in each course was expressed in Carnegie units.⁵ To receive credit for a course, the student must have earned a passing grade (pass, D- or higher).

Students who transferred from public to private schools between their sophomore and senior years were eliminated from public/private comparisons. To be considered as having participated in a vocational education program of study, a student had to select one of seven vocational areas (agricultural, business or office, distributive education, health, home economics, technical, or trade and industrial occupations) in response to the question, "Which of the following best describes your present high school program?" The student also had to have earned at least one credit in vocational education.

Sample Size

HS&B base-year data were collected in 1980 from over 30,000 sophomores and 28,000 seniors in 1,015 public and private schools across the Nation. As part of the first follow-up survey, transcripts were requested in fall 1982 for a subsample of 18,152 members of the sophomore cohort. A total of 15,941 transcripts were actually obtained. The number of these that were complete and that indicated graduation was 12,292, the number used in the analysis reported here (1,969 transcripts were eliminated because the student had dropped out of school before graduation; 799 were eliminated because they were incomplete; and 881 were eliminated because they failed to indicate either a dropout status or graduation). If the 3,649 deleted transcripts had been included in the analysis, the average total vocational credits earned would have fallen from 4.2 (as displayed in table 1) to 3.7 credits. This means that the sample restrictions tended to over represent the number of credits earned by the typical high school student as compared to the graduate.

⁵A Carnegie unit requires a minimum of 200 minutes for a regular class and 275 minutes for a lab class per week for 36 weeks. Some schools, however, may require more time for a credit.

For the public vs. private school comparisons, an additional 150 students were eliminated because they had transferred from a public to a private school (or vice versa) between their sophomore and senior years.

Standard Errors

Group differences cited in the text are statistically significant at the .05 level on the basis of two-tailed t tests. Standard errors for all estimates in this bulletin were calculated using the Balanced Repeated Replicates (BRR) method. The following text shows the range of standard errors for each vocational education area given in the tables.

Standard errors

Vocational education (total)		
Total credits	.07	- .15
Percentage participating	.19	- 2.57
Occupational education (total)		
Total credits	.05	- .14
Percentage participating	1.03	- 2.13
Exploratory education (total)		
Total credits	.03	- .08
Percentage participating	.52	- 1.36

For subcategories within the above main categories the standard errors for earned credits ranged from .01 to .06 for all cases except for the following:

Occupational trade and industrial	- .09
Exploratory trade and industrial	- .10

For More Information

This bulletin was prepared by Jeffrey A. Owings of the Longitudinal Studies Branch, NCES. Additional information about this analysis and High School and Beyond is available from David A. Sweet, National Center for Education Statistics, 400 Maryland Avenue SW. (Brown Building, Room 609), Washington, D.C. 20202, telephone (202) 254-7230.

Table 1.--Mean number of credits earned in vocational areas and in all areas during 4 years of high school by 1980 sophomores graduating in 1982, and the percentage of students participating in each, by type of school (public or private)

Area	All schools		Public schools		Private schools	
	Mean	Percent participating	Mean	Percent participating	Mean	Percent participating
All areas (including academic)	21.8	(100)	21.6	(100)	23.1	(100)
Vocational education (total)	4.2	(95)	4.4	(96)	2.0	(84)
Agriculture	0.2	(9)	0.2	(10)	*	(3)
Business	1.6	(72)	1.6	(72)	1.2	(67)
Marketing	0.1	(9)	0.2	(9)	*	(4)
Technical	0.1	(11)	0.1	(11)	0.1	(10)
Health	*	(2)	*	(3)	*	(1)
Trade & industrial	0.7	(34)	0.8	(36)	0.2	(12)
Voc. home economics	0.1	(9)	0.1	(9)	*	(5)
Industrial arts	0.7	(35)	0.7	(37)	0.2	(17)
Consumer home economics	0.6	(48)	0.7	(50)	0.3	(30)
Occupational voc. ed. (total)	2.0	(75)	2.1	(77)	0.9	(56)
Agriculture	0.2	(8)	0.2	(9)	*	(3)
Business	0.9	(46)	0.9	(47)	0.6	(39)
Marketing	0.1	(8)	0.2	(9)	*	(4)
Technical	0.1	(11)	0.1	(11)	0.1	(10)
Health	*	(2)	*	(3)	*	(1)
Trade & industrial	0.6	(25)	0.6	(28)	0.1	(8)
Voc. home economics	0.1	(9)	0.1	(9)	*	(5)
Exploratory voc. ed. (total)	2.2	(89)	2.3	(90)	1.1	(73)
Industrial arts	0.7	(35)	0.7	(37)	0.2	(17)
Consumer home economics	0.6	(48)	0.7	(50)	0.3	(30)
Agriculture	*	(2)	*	(3)	*	(**)
Business	0.7	(61)	0.7	(62)	0.6	(57)
Marketing	*	(**)	*	(**)	*	(**)
Trade & industrial	0.2	(13)	0.2	(13)	*	(5)
(Sample size)	12,292†		9,295		2,847	

* Less than 0.05 credit.

**Less than .5 percent.

† Total sample size includes transfer students (i.e. students transferring from public to private school or vice versa between their sophomore and senior years).

Table 2.--Mean number of credits earned in vocational areas and in all areas during 4 years of high school by 1980 sophomores graduating in 1982, by geographical region and school community type

Area	Geographic region				School community type		
	Northeast	South	North Central	West	Urban	Suburban	Rural
All areas (including academic)	21.9	21.5	21.2	22.3	21.1	21.9	21.6
Vocational education (total)	4.0	4.5	4.8	4.2	4.1	4.2	4.9
Agriculture	0.1	0.3	0.3	0.2	0.1	0.1	0.4
Business	1.5	1.7	1.7	1.3	1.4	1.6	1.8
Marketing	0.1	0.2	0.2	0.1	0.2	0.2	0.1
Technical	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Health	*	0.1	*	*	0.1	*	*
Trade & industrial	0.7	0.8	0.8	0.9	0.9	0.8	0.8
Voc. home economics	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Industrial arts	0.8	0.5	0.8	0.8	0.6	0.7	0.8
Consumer home economics	0.4	0.8	0.8	0.7	0.6	0.6	0.9
Occupational voc. ed. (total)	2.0	2.2	2.3	1.8	2.0	2.0	2.3
Agriculture	0.1	0.3	0.2	0.1	0.1	0.1	0.4
Business	0.9	0.9	1.0	0.8	0.8	0.9	1.0
Marketing	0.1	0.2	0.2	0.1	0.2	0.2	0.1
Technical	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Health	*	0.1	*	*	0.1	*	*
Trade & industrial	0.6	0.7	0.6	0.6	0.7	0.6	0.6
Voc. home economics	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Exploratory voc. ed. (total)	1.9	2.3	2.6	2.4	2.0	2.2	2.6
Industrial arts	0.8	0.5	0.8	0.8	0.6	0.7	0.8
Consumer home economics	0.4	0.8	0.8	0.7	0.6	0.6	0.9
Agriculture	*	0.1	*	*	*	*	0.1
Business	0.6	0.8	0.7	0.6	0.6	0.6	0.8
Marketing	*	*	*	*	*	*	*
Trade & industrial	0.1	0.1	0.2	0.3	0.2	0.2	0.1
Exploratory courses	83.3	90.9	93.5	93.7	90.0	89.2	92.8
Occupational courses	71.8	75.2	82.3	77.0	75.4	74.9	80.6
Vocational courses (total)	92.0	96.8	97.3	97.0	96.4	94.9	97.3
(Sample size)	1,921	2,844	2,619	1,911	2,108	4,386	2,801

* Less than 0.05 credit.

Table 3.--Mean number of credits earned in vocational areas and in all areas during 4 years of high school by 1980 sophomores graduating in 1982, by school size

Area	School size		
	1 to 600 students	601 to 1,800 students	1,801 plus students
	mean number of credits		
All areas (including academic)	21.4	21.6	21.9
Vocational education (total)	5.0	4.4	4.0
Agriculture	0.6	0.2	0.1
Business	1.8	1.6	1.4
Marketing	0.1	0.2	0.2
Technical	0.1	0.1	0.1
Health	*	*	*
Trade & industrial	0.6	0.8	0.9
Voc. home economics	0.1	0.1	0.1
Industrial arts	0.7	0.8	0.7
Consumer home economics	1.1	0.6	0.5
Occupational voc. ed. (total)	2.2	2.2	2.0
Agriculture	0.5	0.1	0.1
Business	1.0	0.9	0.8
Marketing	0.1	0.2	0.2
Technical	0.1	0.1	0.1
Health	*	*	*
Trade & industrial	0.5	0.6	0.7
Voc. home economics	0.1	0.1	0.1
Exploratory voc. ed. (total)	2.8	2.3	2.0
Industrial arts	0.7	0.8	0.7
Consumer home economics	1.1	0.6	0.5
Agriculture	0.1	*	*
Business	0.8	0.7	0.6
Marketing	*	*	*
Trade & industrial	0.1	0.2	0.2
	percentage participating		
Exploratory courses	93.3	90.0	89.
Occupational courses	81.3	76.4	74.6
Vocational courses (total)	97.0	96.0	95.1
(Sample size)	1,439	4,564	2,520

* Less than 0.05 credit.

Table 1.--Mean number of credits earned in vocational areas and in all areas during 4 years of high school by 1980 sophomores graduating in 1982, by race/ethnicity, cognitive test performance, and socioeconomic status

Area	Race/ethnicity			Cognitive test performance			Socioeconomic status		
	Hispanic	Black	White	Low	Middle	High	Low	Middle	High
mean number of credits									
All areas (including academic)	21.5	21.0	21.7	20.9	21.6	22.5	21.2	21.7	22.1
Vocational education (total)	5.0	4.5	4.3	5.4	4.9	2.9	5.2	4.7	3.0
Agriculture	0.2	0.1	0.2	0.3	0.3	0.1	0.2	0.3	0.1
Business	1.5	1.5	1.6	1.6	1.9	1.2	1.9	1.7	1.1
Marketing	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1
Technical	*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Health	0.1	0.1	*	0.1	*	*	0.1	0.1	*
Trade & industrial	1.2	1.0	0.7	1.3	0.8	0.4	0.9	0.8	0.5
Voc. home economics	0.1	0.1	0.1	0.1	0.1	*	0.2	0.1	0.1
Industrial arts	0.9	0.5	0.7	0.8	0.8	0.6	0.7	0.8	0.6
Consumer home economics	0.9	0.9	0.6	1.0	0.8	0.4	1.0	0.7	0.4
Occupational voc. ed. (total)	2.3	2.2	2.1	2.6	2.4	1.3	2.5	2.2	1.4
Agriculture	0.2	0.1	0.2	0.3	0.2	0.1	0.2	0.2	0.1
Business	0.9	0.8	1.0	0.9	1.1	0.6	1.1	1.0	0.6
Marketing	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.1
Technical	*	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Health	0.1	0.1	*	0.1	*	*	0.1	0.1	*
Trade & industrial	0.9	0.7	0.6	1.0	0.6	0.3	0.7	0.6	0.4
Voc. home economics	0.1	0.1	0.1	0.1	0.1	*	0.2	0.1	0.1
Exploratory voc. ed. (total)	2.7	2.4	2.2	2.8	2.5	1.6	2.7	2.4	1.6
Industrial arts	0.9	0.5	0.7	0.8	0.8	0.6	0.7	0.8	0.6
Consumer home economics	0.9	0.9	0.6	1.0	0.8	0.4	1.0	0.7	0.4
Agriculture	*	*	*	*	*	*	*	*	*
Business	0.6	0.7	0.7	0.7	0.8	0.6	0.8	0.7	0.6
Marketing	*	*	*	*	*	*	*	*	*
Trade & industrial	0.3	0.3	0.1	0.3	0.2	0.1	0.2	0.2	0.1
percentage participating									
Exploratory courses	93.9	93.9	89.5	95.2	93.2	82.1	94.4	92.1	83.4
Occupational courses	79.0	77.9	76.6	83.2	81.2	64.5	82.3	78.9	66.6
Vocational courses (total)	98.1	98.4	95.3	99.4	97.9	89.9	98.8	96.8	91.5
(Sample size)	1,964	1,295	5,515	1,843	4,010	2,148	2,285	4,084	1,836

* Less than 0.05 credit.

Table 5.--Mean number of credits earned in vocational areas and in all areas during 4 years of high school by 1980 sophomores graduating in 1982, by sex and program of study

Area	Academic			General			Vocational		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
mean number of credits									
All areas (including academic)	22.3	22.3	22.4	21.2	20.9	21.6	21.4	21.1	21.6
Vocational education (total)	2.7	2.8	2.7	4.6	4.5	4.7	6.5	6.3	6.6
Agriculture	0.1	0.1	*	0.2	0.4	0.1	0.3	0.7	0.1
Business	1.1	0.8	1.4	1.5	0.9	2.1	2.4	0.8	3.7
Marketing	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3
Technical	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Health	*	*	*	*	*	0.1	0.1	*	0.1
Trade & industrial	0.2	0.5	0.2	0.8	1.0	0.5	1.4	2.3	0.7
Voc. home economics	*	*	0.1	0.1	0.1	0.2	0.1	*	0.2
Industrial arts	0.5	0.9	0.1	0.9	1.5	0.2	0.9	1.8	0.1
Consumer home economics	0.4	0.2	0.6	0.9	0.4	1.4	0.8	0.3	1.2
Occupational voc. ed. (total)	1.1	1.1	1.2	1.9	1.8	2.0	3.7	3.3	4.0
Agriculture	0.1	0.1	*	0.2	0.3	0.1	0.3	0.6	0.1
Business	0.5	0.3	0.7	0.8	0.4	1.3	1.6	0.4	2.6
Marketing	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.3
Technical	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Health	*	*	*	*	*	0.1	0.1	*	0.1
Trade & industrial	0.3	0.4	0.1	0.6	0.8	0.3	1.1	2.0	0.5
Voc. home economics	*	*	0.1	0.1	0.1	0.2	0.1	*	0.2
Exploratory voc. ed. (total)	1.6	1.7	1.5	2.7	2.7	2.7	2.8	3.0	2.6
Industrial arts	0.5	0.9	0.1	0.9	1.5	0.2	0.9	1.0	0.1
Consumer home economics	0.4	0.2	0.6	0.9	0.4	1.4	0.8	0.3	1.2
Agriculture	*	*	*	*	*	*	0.1	0.1	*
Business	0.6	0.5	0.7	0.7	0.5	0.9	0.8	0.4	1.1
Marketing	*	*	*	*	*	*	*	*	*
Trade & industrial	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.4	0.2
percentage participating									
Exploratory courses	83.2	82.0	84.2	94.2	92.9	95.7	95.5	94.6	96.2
Occupational courses	62.5	62.0	63.0	80.6	76.8	85.0	91.9	87.8	95.1
Vocational courses (total)	90.6	90.4	90.7	98.5	98.4	98.7	100.0	100.0	100.0
(Sample size)	3,322	1,591	1,731	3,182	1,654	1,528	2,503	1,164	1,339

* Less than 0.05 credit.